

What Is Claimed Is:

1. A semiconductor manufacturing method, including a step of detecting the position of the orientation flat or notch of a substrate and aligning it to a specific position, wherein a substrate transfer unit that transfers substrates to a processing chamber or processing jig is used for the orientation flat or notch alignment of said substrates.

2. The semiconductor manufacturing method according to Claim 1, wherein the orientation flat or notch alignment of the substrates is performed in a transfer chamber in which said substrate transfer unit is installed.

3. The semiconductor manufacturing method according to Claim 1, wherein the substrates are removed from a substrate carrier by said substrate transfer unit and put into a substrate alignment apparatus that performs the orientation flat or notch alignment of the substrates, and the substrates are taken out of said substrate alignment apparatus by said substrate transfer unit after the orientation flat or notch alignment of the substrates and transferred to the processing chamber or processing jig.

4. The semiconductor manufacturing method according to Claim 1, wherein the orientation flat or notch alignment of the substrates is performed ahead of time by exchanging

substrate carriers and repeating the following steps (a) to (d):

(a) the substrates are removed from the substrate carrier by said substrate transfer unit and put into a substrate alignment apparatus that performs the orientation flat or notch alignment of the substrates, and orientation flat or notch alignment of the substrates is performed;

(b) the substrates that have undergone orientation flat or notch alignment are taken out of said substrate alignment apparatus and returned to said substrate carrier by said substrate transfer unit;

(c) repeating the above steps (a) and (b) until the orientation flat or notch alignment is finished for all of the substrates in said substrate carrier; and

(d) the substrate carrier for which the orientation flat or notch alignment of the substrates has been finished is stored on a storage shelf.

5. The semiconductor manufacturing method according to Claim 4, including a step in which, if the orientation flat or notch alignment of the substrates in the substrate carrier has been performed ahead of time, this information is stored,

a judgment as to whether the substrates to be transferred have already undergone orientation flat or notch alignment is made on the basis of this information when the substrates are transferred, and

if the substrates to be transferred have already undergone orientation flat or notch alignment, then the

substrates are taken out of the substrate carrier by said substrate transfer unit and transferred directly to the processing chamber or processing jig without first going through said substrate alignment apparatus.

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6. A semiconductor manufacturing method including a step of detecting the position of the orientation flat or notch of a substrate and aligning it to a specific position,

10 wherein said orientation flat or notch alignment of each substrate is performed by placing the substrate horizontally and rotating it while the outer periphery of the substrate is supported by a substrate support component.

15 7. The semiconductor manufacturing method according to Claim 6, including a step in which said substrate is temporarily retracted from said substrate support component so that the relative positions of said substrate and said substrate support component in the peripheral direction are shifted,

20 and then the retracted substrate is once again supported by said substrate support component.

25 8. The semiconductor manufacturing method according to Claim 7, wherein, in the shifting of the relative positions of said substrate and said substrate support component in the peripheral direction,

the position of said substrate support component is corrected so that the orientation flat or notch of the substrate will not overlap with the substrate support

component, or so that the substrate support component will not block the forward path of the substrate transfer unit component as the substrate is taken out of said substrate support component by the substrate transfer unit.

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9. The semiconductor manufacturing method according to Claim 8, wherein, if there is overlap between said substrate support component and said orientation flat or notch of the substrate while the substrate outer periphery is supported by the substrate support component,

the substrate is temporarily retracted from said substrate so that the relative positions of the substrate and the substrate support component in the peripheral direction are shifted,

and then said substrate is once again supported by the substrate support component, thereby avoiding said overlap.

10. The semiconductor manufacturing method according to Claim 8, wherein said substrate is temporarily retracted from said substrate support component after said orientation flat or notch alignment of the substrate, and said substrate support component is set in a tolerance position that doesn't block the forward path of the substrate transfer unit,

after which said substrate is once again supported by the substrate support component.

11. A semiconductor manufacturing method including a step of detecting the position of the orientation flat or notch of a substrate and aligning to a specific position,

wherein, in the orientation flat or notch alignment of a plurality of substrates,

the plurality of substrates are stacked and supported by a substrate support mechanism and rotated all together by the required angle, whereby the orientation flats or notches of all of the substrates are detected by a detection sensor, and the detection information is stored,

the substrate support mechanism is rotated on the basis of said detection information so as to perform orientation flat or notch alignment for one substrate at a time, each substrate that has undergone orientation flat or notch alignment is retracted from the substrate support mechanism one by one while the position of said each substrate in the peripheral direction is maintained, and

after the orientation flat or notch alignment and retraction are finished for all of the substrates, the retracted substrates are returned to the substrate support mechanism.

12. The semiconductor manufacturing method according to Claim 11, including a step of rotating the plurality of substrates all at once by a specified angle when the orientation flat or notch position of the plurality of substrates cannot be detected because the orientation flat or notch position is too far away from the place where the detection sensor is installed, so that said orientation flat

or notch position is brought closer to said place where the detection sensor is installed and the orientation flat or notch position can be detected, through this rotation by said specified angle.

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13. The semiconductor manufacturing method according to Claim 11, wherein, when the orientation flats or notches of the substrates cannot be detected even when the substrate support mechanism is rotated by the required angle, the following steps (a) to (d) are performed so as to allow orientation flat or notch detection:

(a) the substrates are retracted from the substrate support mechanism;

(b) the substrate support mechanism is rotated by a specified angle;

(c) the substrates are returned to the substrate support mechanism; and

(d) the substrate support mechanism is rotated by the required angle and the orientation flat or notch position is detected.

14. The semiconductor manufacturing method according to Claim 11, wherein, in the alignment of the orientation flats or notches of the substrates to a specific position after completion of the orientation flat or notch position detection operation for all of the substrates, if the orientation flat or notch of the substrate cannot be aligned to the specific position with a single rotation because the orientation flat or notch position is too far away from the

specific position, the following steps are repeatedly performed until the orientation flat or notche of the substrate is aligned with the specified position:

(a) the substrate support mechanism is rotated the
5 required amount in the direction that is the shortest path from the orientation flat or notch position to the specified position;

(b) the substrates are retracted from the substrate support mechanism;

10 (c) the substrate support mechanism is rotated the required amount in the opposite direction from that in (a);
and

(d) the substrates are returned to the substrate support mechanism.

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15. The semiconductor manufacturing method according to any of Claim 8, wherein orientation flat or notch alignment is performed all at once for a plurality of substrates.